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Phenomena of Jupiter's Satellites.

Day.	Satellite.	Phenomenon.	Telescope.	Power.	Mean Solar Time of Observation. h m s	Mean Solar Time of N.A. h m s	Observer.
1895 Jan. 9	II.	Tr. Ing. First contact	28-inch Equat.	450	10 18 48	10 20	L.
9	II.	Last contact	,,	,,	10 22 15		,,
14	III.	Occ. D. Last seen	Sheepsh. Equat.	55	6 45 53	6 43	H. F.
18	II.	Ecl. R. First seen	,,	200	11 23 14	11 23 58	C. D.
18	II.	Bisection	,,	,,	11 25 2		,,
18	II.	Full brightness	,,	,,	11 26 42		,,
18	I.	Tr. Ing. First contact	,,	100	12 52 56	12 52	,,
18	I.	Bisection	,,	,,	12 54 25		,,
18	I.	Last contact	,,	,,	12 56 50		,,
21	III.	Occ. D. First contact	,,	200	10 2 18	10 5	A. C.
21	III.	Bisection	,,	,,	10 4 23		,,
21	III.	Last seen	,,	,,	10 8 10		,,
21	III.	Occ. R. Last contact	,,	,,	12 52 47	12 54	,,
21	III. (*a*)	Ecl. D. Began to fade	,,	,,	12 56 58	13 2 49	,,
21	III.	Last seen	,,	,,	13 2 1		,,
25	II.	Occ. D. First contact	,,	,,	9 45 9	9 49	,,
25	II.	Bisection	,,	,,	9 47 57		,,
25	II.	Last seen	,,	,,	9 51 7		,,

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Day.	Satellite.	Phenomenon.		Telescope.	Power.	Mean Solar Time of Observation.	Mean Solar Time of N.A.	Observer.
						h m s	h m s	
Jan. 28	I.	Ecl. R.	First seen	Sheepsh. Equat.	200	9 20 42	9 21	H.
28	I.		Full brightness	,,	,,	9 22 26		,,
Feb. 11	I.	Occ. D.	First contact	,,	120	9 49 47	9 52	B.
11	I.		Last seen	,,	,,	9 53 36		,,
11	I.	Ecl. R.	First seen	,,	,,	13 12 10	13 12 6	,,
19	II.	Occ. D.	First contact	,,	,,	6 7 1	6 8	,,
19	II.		Last seen	,,	,,	6 11 11		,,
19	III.	Ecl. R.	First seen	,,	,,	7 53 3	7 55 18	,,
19	I.	Tr. Ing.	First contact	,,	,,	8 57 24	8 58	,,
19	I.		Bisection	,,	,,	9 0 33		,,
19	I.		Last contact	,,	,,	9 3 33		,,
19	II.	Ecl. R.	First seen	,,	,,	11 2 3	11 3 8	,,
19	I.	Tr. Egr.	First contact	,,	,,	11 9 52	11 15	,,
19	I.		Bisection	,,	,,	11 13 21		,,
19	I.		Last contact	,,	,,	11 16 31		,,
19	IV.	Ecl. D.	Last seen	,,	,,	13 47 36	13 24 6	,,
Mar. 14	II. (*b*)	Tr. Ing.	First contact	,,	,,	8 22 27	8 21	H. F.
14	II.		Bisection	,,	,,	8 24 41		,,
14	II.		Last seen	,,	,,	8 25 45		,,

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Day.	Satellite.	Phenomenon.		Telescope.	Power.	Mean Solar Time of Observation. h m s	Mean Solar Time of N.A. h m s	Observer.
Mar. 14	II. (*c*)	Tr. Egr.	Last contact	Altaz.	100	11 2 59	10 59	H. F.
Apr. 23	I.	Ecl. R.	First seen	Sheepsh. Equat.	140	8 29 1	8 28 58	A. C.
23	I.		Full brightness	,,	,,	8 30 35		,,
24	II.	Ecl. R.	First seen	,,	200	10 21 47	10 22 34	H.
24	II.		Full brightness	,,	,,	10 24 2		,,
May 8	I.	Tr. Egr.	First contact	,,	200	8 31 56	8 34	,,
8	I.		Last contact	,,	,,	8 36 11		,,
Nov. 14	I.	Ecl. D.	Last seen	,,	120	13 22 12	13 21 41	B.
14	IV.	Ecl. D.	Last seen	,,	,,	13 48 18	13 42 22	,,
18	III.	Ecl. D.	Began to fade	,,	,,	12 24 35	12 30 34	A. C.
18	III.		Last seen	,,	,,	12 31 57		,,
23	I.	Occ. R.	First seen	,,	,,	13 9 6	13 11	,,
23	I.		Bisection	,,	,,	13 11 9		,,
23	I.		Last contact	,,	,,	13 13 8		,,
23	IV.	Tr. Egr.	Last contact	,,	,,	13 38 1	13 51	,,
23	II.	Ecl. D.	Began to fade	,,	,,	13 40 26	13 42 45	,,
23	II.		Last seen	,,	,,	13 44 32		,,

Day.	Satellite.	Phenomenon.		Telescope.	Power.	Mean Solar Time of Observation. h m s	Mean Solar Time of N.A. h m s	Observer.
Nov. 30	I. (*d*)	Ecl. D.	Began to fade	Sheepsh. Equat.	120	11 35 20	11 36 16	A. C.
30	I.		Last seen	,,	,,	11 36 52		,,
Dec. 7	I.	Ecl. D.	Began to fade	,,	55	13 28 11	13 29 31	S.
7	I.		Last seen	,,	,,	13 29 46		,,
31	I.	Tr. Ing.	Bisection	,,	200	11 30 50	11 30	H.
31	I.		Last contact	,,	,,	11 33 35		,,
31	III.	Ecl. D.	Last seen	,,	,,	12 20 10	12 18 55	,,

Notes.

(*a*) Too near Jupiter for accurate observation. (*b*) Very cloudy. (*c*) Very cloudy.
(*d*) Not a very good observation; sky bright, slight haze.

The aperture of the 28-inch Equatorial is 28 inches, of the Astrographic Guiding Telescope 10 inches, of the Sheepshanks Equatorial 6·7 inches, of the Corbett Telescope 6·5 inches, and of the Altazimuth 4 inches.

The initials D., L., H., A. C., B., H. F., C. M., C. D., R. C., D. E., W. B., J., S., and W., are those of Mr. Dyson, Mr. Lewis, Mr. Hollis, Mr. Crommelin, Mr. Bryant, Mr. Furner, Mr. Martin, Mr. Davidson, Mr. Cheeseman, Mr. Edney, Mr. Bowyer, Mr. Johns, Mr. Showell, and Mr. Witchell respectively.

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On the Drift of the Surface Material of Jupiter in different Latitudes. By A. Stanley Williams.

The remarkable appearance presented by the great red spot on *Jupiter* in 1879 and subsequent years gave a great impetus to the physical observation of this planet. Notwithstanding, however, the numerous important investigations which resulted therefrom, and the many determinations of the period of rotation made from different markings in various latitudes, the question of the drift, or various rates of rotation, of the surface material in different latitudes still seems to be properly understood by only a very few. This is doubtless due in great measure to the fact that the chief investigations on the subject are scattered through the various publications of the years immediately following the apparition of the red spot, many of them not being very accessible, and that little has yet been done to bring together and adequately discuss the abundant existing material.

A great many determinations of rotation period in various latitudes were discussed by M. Belopolsky in a valuable paper published a few years ago,* the existence of the great equatorial current receiving full recognition. But, owing principally to the circumstance that a large number of results based on insufficient material were included in this discussion, the various minor, but yet very important, currents escaped notice.

In the present paper most of the chief thoroughly satisfactory determinations of rotation period are brought together and discussed under the heads of the different atmospheric currents to which they refer. The original sources of information have been referred to in nearly every case, and although it is probable that some first-class determinations may have been omitted, yet it is believed that all those contained in this paper are thoroughly to be relied upon. A good many results have been rejected from various causes; such as uncertainty as to the correct identification of the markings observed, or the short period of time over which the observations extend. And all determinations based solely upon positions derived from sketches have been rigidly excluded, experience having shown that such results are quite unreliable, except, possibly, in a few cases where the observations extend over very long periods of time.

In the present state of our knowledge there are nine distinct atmospheric currents recognisable upon *Jupiter*. Others will doubtless be added as our acquaintance with the planet becomes more intimate. But these nine currents are absolutely certain, and their boundaries are also well established within narrow limits, although it seems probable that, in some cases at least, these boundaries may vary slightly in position from time to time.

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* "Ueber die Rotation des Jupiter," Mélanges mathématiques et astron. tirés du *Bulletin de l'Acad. impériale des Sciences de St.-Pétersbourg*, t. vii. 104.